Counter-Comments on TRAI's Consultation Paper on Assignment of Spectrum for Space-based Communication Services

At the outset, we wish to laud the Authority for this excellent Consultation Paper on a subject of extreme strategic importance. We also wish to take this opportunity to provide our counter-comments to the aforesaid paper to correct some prevailing flawed notions and issues and to emphasise and re-emphasise certain points already made earlier at the stage of filing the comments.

Here is a short analysis of the 64 comments received by TRAI.

Category	Total	For Auction	For auction (%)	Against Auction	Against Auction (%)	Neutral	Remarks
Industry Associations	15	2	13%	12	80%	1	
System Integrator	1	0	0%	1	**100%**	0	
Satellite Broadband Service Providers	2	0	0%	2	**100%**	0	VSAT Service Providers
Satellite Operators	11	0	0%	11	**100%**	0	Satellite operators serving India through SPs
Large Telecom Service Providers	4	2	50%	2	50%	0	Having both Terrestrial and Satellite porfolios
MSOs	3	3	**100%**	0	0%	0	Cable based
Broadcast/DTH operators	5	0	0%	5	**100%**	0	Teleport /DTH operators
Startups	11	0	0%	11	**100%**	0	Space startups
Independent Stakeholders	12	6	50%	4	33%	2	Individuals and Independent Research Agencies
Totals	**64**	**13**	**20%**	**48**	**75%**	**3**	

From the data above we wish to highlight the following:

- 100% of the space startups that have submitted their opinions are opposed to auction, as well as 100% of the teleport/DTH operators, 100% of the

VSAT Service Providers, 100% of the system integrators and, naturally, 100% of the Satellite operators serving India.

- Out of **the 20% of the interested parties that are in favour of an auction**, the composition is as follows viz., 13% of the industry associations supporting mobile operators, half of the large TSPs and half of the individuals and research agencies that have submitted a response and 100% MSOs.

- These numbers clearly reflect that an overwhelming majority of the industry, consumers and connected services are in favour of administrative allocation of spectrum. This data should be kindly taken cognisance of by TRAI while finalising their recommendations.

Our detailed Counter Comments are given below:

1. It is seen that some respondents are citing Technological advancements as the need for reshaping the traditional use of specific spectrum bands by allowing different access technologies viz. satellite and terrestrial, to use the same frequencies, thereby advocating mixed/flexible use. There would be serious limitations if flexible/mixed use is recommended and it would be a big hassle to administer the same, basis the inputs given below.

   No IMT allocation required in the 27.5- 28.5 GHz band. Hence no mixed/flexible use. TRAI should not recommend use of the 27.5-28.5 band for any other services, this band should exclusively be reserved for satellite services. Given that there is enough availability of frequency in other bands for use by IMT/ 5G, TRAI should not recommend allocating the 27.5-28.5 GHz band for IMT. This would lead to limited availability of spectrum for IMT as well as satellite. As we know, a lot of spectrum in the 26 GHz band remained unsold in the recent 2022 5G auctions. This makes it clear that there is no additional demand for 5G in these bands. Keeping the 27.5-28.5 band reserved for satellite will not result in any adverse impact on rollout of 5G.

   We therefore strongly recommend that there be no flexible/mixed use in any of the satellite bands. IMT has been assigned as much as 18.83 Ghz of spectrum till date, a majority of which has not been utilised, as compared to a paltry amount assigned for satellite and broadcasting. The IMT spectrum bands include 37-43.5, 45.5-47, 47.2–48.2, and 66–71 GHz bands. Also, it may be noted that the WRC-23 agenda also does not identify the 27.5 - 28.5 GHz band for IMT use.

Convergence between terrestrial and satellite networks (aka 3GPP Rel. 17 /18) is being cited that has led to the development of integrated networks, where both types of networks can utilize common frequency bands. None of these integrated networks are currently deployed globally.

1. It is being incorrectly mentioned by some respondents that commercial deployments of satellite networks offering voice and data services, directly

compete with terrestrial networks and to ensure that spectrum assignment rules for networks offering competing services are uniform and fair, spectrum auction is the only viable strategy.

2. For mobile services, mobility is the biggest offering. It allows a handheld or a wearable device to access voice, data on the move in addition to provision of fixed broadband. Whereas FSS provides fixed broadband, ESIM, Backhauls and these services are not offered by mobile. Therefore, it is unfair to compare both the services. Comparison between two differently placed services by different players who have different rights and obligations, cannot be deemed as similar/competing services.

Following reasons clearly illustrate as to how satellite and terrestrial spectrum are inherently different:

(i) **Satellite Spectrum is a shared resource** Unlike terrestrial mobile network operators, satellite operators use the same frequencies across multiple satellites without interfering with each other. They also coordinate with each other in sharing the same frequencies across their services. Fixed satellite systems are technologically capable of sharing spectrum while also operating efficiently. The ITU coordination mechanisms enable the operators to manage interference and provide these services efficiently. Satellite services can share spectrum across several GSO/NGSO systems without fragmenting the spectrum. Interference can easily be avoided by following sharing conditions specified in Article 9 of the ITU Radio Regulations. As a result, the satellite spectrum is never exclusively assigned as opposed to the mobile access spectrum and hence is never auctioned.

(ii) Satellite spectrum and mobile spectrum are unequals by virtue of circumstances in which they are placed.: While the mobile operators have several unique and precious rights like right to interconnection, right to interference-free spectrum, right to unique numbering resources and right of way, Satellite operators have none of these, despite being a licensed entity. As per Art. 14 of the Constitution of India, the two have to be treated differently on a mandatory basis because case law has established that unequals are not permitted to be treated as equals.

(iii) Inefficient spectrum usage: In a conventional auction for terrestrial spectrum, the capacity is created by slicing the total available spectrum into various block sizes and each block is assigned individually to winners for exclusive use. However, the auction method cannot be followed for satellite spectrum due to the highly inefficient frequency reuse capability, which restricts the use of the spectrum only to a few operators and significantly reduces its value. Moreover, the sharing of frequencies between operators is what results in large capacities being available over a given geography.

(iv) Grossly different revenue potentials and payment capacity: Terrestrial mobile operators and satellite VSAT operators are on completely different footings – virtually located in different universes. The current annual revenue of Indian mobile operators is about Rs.2.5 lakh crores i.e. Rs.250000/- whereas that of the Indian satellite VSAT operators is only around Rs. 500/- crores. Satellite services are therefore as miniscule

as 1/500th or a mere 0.2% of the mobile operators' revenue. It would be a travesty of justice to equate the two in treatment of mode of allocation of spectrum resource.

It would therefore be incorrect and unfair to put the two groups through the same or similar allocation method.

3. It has also been incorrectly cited that satellite spectrum has been successfully auctioned in countries like Saudi Arabia and Thailand. This is a gross misrepresentation.

No Government in the world has auctioned spectrum especially in the micro/ millimetre wave bands for satellites or is considering to do so. In the past, a few countries (U.S., Brazil and Mexico) that tried to follow the auction of the satellite orbital slot (and not spectrum) saw that even the auction of orbital resources along with right to use spectrum proved very problematic and the countries discontinued the approach.

The few countries that have tried to auction satellite assets for domestic use, such as national orbital slots, have either abandoned the practice (as observed in the US since 2004 and Brazil since 2021) or encountered difficulties with unsuccessful auctions (as seen in Thailand and Mexico).

In case of Saudi Arabia, although a portion of the MSS "S band" was auctioned once, half of the spectrum was sold for terrestrial use with the potential for conversion, raising doubts about its long-term focus on space-based communications. Hence the two situations are not comparable.

Further, recent auctions in Thailand was for **orbital slots and not for satellite spectrum**. The process saw limited participation, with only two bidders, one being a government-owned company, and only three out of five available slots were sold. These cases cannot by any stretch of imagination, be deemed as a successful auction.

4. **No interference/ adverse effect by LEO systems to broadcast/ DTH services**

Few respondents have mentioned that LEOs can interfere with DTH/ broadcast services. However, this is incorrect primarily because broadcast services operate in the C Band, whereas LEOs presently operate in the Ka band. DTH systems in India operate in portion of the Ku Band meant for FSS. In case of overlap in use of any bands, limits specified in Article 22 can be used to manage interference. Also, GSO and NGSOs can coordinate in bands where Article 22 limits do not apply.

5. It has been incorrectly stated by some respondents that the administrative assignment of spectrum is analogous to an approach where spectrum is allocated on a first-come, first-served basis. This is a completely flawed understanding.

a) This amounts to stating that the entire Microwave backhaul spectrum which has been awarded for the past 20+ years on administrative

basis to the operators, has been given incorrectly by a method and should be taken back and put to auction from retrospective date.

b) It has often been cited incorrectly that the Hon'ble Supreme Court unambiguously declared that the right to use such spectrum can only be transferred through a transparent auction.

BIF's detailed comments on this legal matter are given as here under:

(i) State actions, whether it relates to the distribution of natural resources or grant of contracts, must be tested against the touchstone of Article 14 of the Constitution, and may not be struck down for being arbitrary without consideration to the actual constitutional infirmities associated with such action.

(ii) Auction cannot be considered a "constitutional mandate", as it would stand in complete contravention to the scheme of Article 14.

(iii) Allocation of natural resources to the highest bidder may not necessarily be the only way to sub serve the common good and, at times, may run counter to the public good. "Distribution", as envisaged under Article 39(b) has broad contours, and cannot be limited to meaning only a singular method of resource disposal i.e., auction. The overarching and underlying principle governing distribution is the 'furtherance of common good.' As the allocation of resources is primarily intended towards serving public interest and the "common good", it cannot ipso facto be interpreted that auction represents the best method for allocation. (para. 119, Reference (Supra)

(iv) Lastly, the potential for abuse in other resource allocation methods could not be the basis for considering auctions as a legal/ constitutional mandate, as there was an equal potential for abuse in an auction.

(v) The 2G Case, was solely examining the issue of allocation in respect of mobile/terrestrial spectrum without deliberating on the allocation of satellite spectrum. Telecom / mobile license holders have access to 'back haul' networks, which were not disturbed/cancelled. This is indicative of the fact that the sole consideration in the 2G matter was the method and manner of grant of licenses for operation of mobile/cellular networks, which is distinct from satellite spectrum.

(vi) In light of the above decisions, the issue of satellite spectrum allocation, should be guided by the overarching principles of: (a) maximizing the greater good/ furtherance of the common good; and (b) adopting a fair, reasonable and transparent method of allocation which is in consonance with principles of Article 14 of the Constitution.

(vii) The importance of spectrum as was during the earlier 2G Case and today current where the Court, in Anuradha Bhasin v Union of India, has ruled that expression through the internet and carrying on trade via the internet are an intrinsic part of the fundamental right of free speech under Article 19(1)(a) and freedom of trade and business under Article 19(1)(g). Any consideration of the greater common good has to necessarily, therefore, consider this exposition of the law.

(viii) Due to the distinctive features of satellite spectrum, the considered opinion is that auctioning satellite spectrum may not be the most appropriate and efficient method of resource allocation. In light of the Hon'ble Supreme Court's decision of auction not being a mandatory process for resource allocation and that the principle underlying the distribution of natural resources should be in furtherance of the common good, administrative assignment of satellite spectrum is a more efficient form of allotment of spectrum.

Following reasons can be ascribed in support of administrative assignment of satellite spectrum:

a. Satellite spectrum is a shared resource. Therefore, it cannot be auctioned which requires exclusive allocation to one bidder, unlike the terrestrial spectrum. The basic prerequisite of a resource that is to be auctioned, is that it should be available for sale as discrete, unique products. Satellite spectrum does not satisfy this elementary criterion.

b. Satellite spectrum has no national territorial limits. It is coordinated and managed by ITU. Consequently, satellite spectrum management is subject to the radio regulation of the ITU, and the various filing requirements which are necessary for orbital slots and satellite deployment. Unlike terrestrial spectrum, satellite spectrum is never exclusively assigned to the operator but coordinated internationally and shared among multiple operators for different orbital slots and all types of satellites. Thus, the terrestrial concept of exclusivity does not apply in the case of satellite spectrum.

c. While determining the most feasible method of spectrum allocation due consideration ought to be given to global practices. Internationally, satellite spectrums have only been allocated through administrative routes. No nation allocates satellite spectrum through auction. In view of this overwhelming international precedent which supports the allocation of spectrum through a non-auction,

administrative route, an administrative mechanism should be chosen for allocating satellite spectrum as opposed to auctioning it.

d. In the conventional auction of terrestrial spectrum, to enable assignment by auctions, the capacity is sliced into various block sizes and each block is assigned individually to winners for exclusive use. However, auctioning satellite spectrum by dividing it into smaller block sizes would result in inefficient spectrum usage. Auction of satellite spectrum by slicing into blocks would result in a highly inefficient frequency reuse capability, which would restrict the use of the spectrum only to a few operators and significantly reduces its value. Moreover, the sharing of frequencies between operators is what results in large capacities being available over a given geography. If spectrum were to be auctioned by dividing it into portions, the fragmentation would adversely affect the efficiency of the spectrum. Furthermore, carving out a chunk of the spectrum, which ought to be shared for optimum utilisation, would require a complicated set of rules for the coordinated operation of different satellites using the same spectrum band, thereby further causing issues in efficient spectrum management.

e. Satellite services are almost the only method available for reaching broadband connectivity to the rural and remote regions as also to regions affected by disaster. Satellite services are truly akin to social welfare services and need to be nurtured, protected and fostered in the public interest. Auctioning satellite spectrum would escalate spectrum prices, and thereby increase the cost of service. This will be against the public interest and severely impact socio-economic welfare. Further, if spectrum bands for the satellite to deliver satellite broadband were to be auctioned to service providers, who may use it for either terrestrial purposes or any other application, the State's objectives of 'Digital India' by connecting rural areas, far flung islands and border areas of the country through satellite broadband for inclusive development would be jeopardized.

f. Furthermore, satellite spectrum auctions could create gatekeepers with deep pockets who could effectively use the allocated satellite spectrum to block new entrants and fair competition. Such gatekeepers could block the entry, both of additional terrestrial or satellite operators, and create a serious anti-competitive effect, going against the spirit of fair market competition, stifling start-ups and development. This would adversely impact the Government's vision of developing a robust space economy in India as it would only benefit the bigger market players who can participate in the auction

bidding process. Several start-ups, incubating organisations, and smaller organisations working on satellite innovation will not have the economic and financial capacities to participate in the auction process where bid prices may be extremely high, thereby creating barriers to market entry.

g. Multiple users of the satellite spectrum i.e., DTH, broadcasters, VSAT, broadcasters and teleport. Besides satellite communication, DTH and broadcasting are powerful tools to cater to the public good. However, penetration of DTH and broadcasting services may be adversely affected in the case of a satellite spectrum auction.

In view of the above, in conclusion, the summary of the response to the queries on this matter is as under:

(i) Whether the law requires that the only way to allocate satellite spectrum is auction? No

(ii) Whether allocation of satellite spectrum for space-based communication services through a non-auction, administrative route, be permissible in law? Yes

(iii) Same Service Same Rules has been cited as in Point No. 2 above

It is being incorrectly mentioned by some respondents that commercial deployments of satellite networks offering voice and data services, directly compete with terrestrial networks and to ensure that spectrum assignment rules for networks offering competing services are uniform and fair, spectrum auction is the only viable strategy. Comparison between two differently placed services by different players who have different rights and obligations, cannot be deemed as similar/competing services.

Following reasons clearly illustrate as to how satellite and terrestrial spectrum are inherently different and hence cannot be guided by the same principles of spectrum delineation.

(i) **Satellite Spectrum is a shared resource** Unlike terrestrial mobile network operators, satellite operators use the same frequencies across multiple satellites without interfering with each other. They also coordinate with each other in sharing the same frequencies across their services. As a result, the satellite spectrum is never exclusively assigned as opposed to the mobile access spectrum and hence is never auctioned.

(ii) **Satellite spectrum and mobile spectrum are unequals by virtue of circumstances in which they are placed.:** While

the mobile operators have several unique and precious rights like right to interconnection, right to interference-free spectrum, right to unique numbering resources and right of way, Satellite operators have none of these, despite being a licensed entity. As per Art. 14 of the Constitution of India, the two have to be treated differently on a mandatory basis because case law has established that unequals are not permitted to be treated as equals.

(iii) **Inefficient spectrum usage:** In a conventional auction for terrestrial spectrum, the capacity is created by slicing the total available spectrum into various block sizes and each block is assigned individually to winners for exclusive use. However, the auction method cannot be followed for satellite spectrum due to the highly inefficient frequency reuse capability, which restricts the use of the spectrum only to a few operators and significantly reduces its value. Moreover, the sharing of frequencies between operators is what results in large capacities being available over a given geography.

(iv) **Grossly different revenue potentials and payment capacity:** Terrestrial mobile operators and satellite VSAT operators are on completely different footings – virtually located in different universes. The current annual revenue of Indian mobile operators is about Rs.2.5 lakh crores i.e. Rs.250000/- whereas that of the Indian satellite VSAT operators is only around Rs. 500/- crores. Satellite services are therefore as miniscule as 1/500th or a mere 0.2% of the mobile operators' revenue. It would be a travesty of justice to equate the two in treatment of mode of allocation of spectrum resource.

It would therefore be incorrect and unfair to put the two groups through the same or similar allocation method.

6. It has been incorrectly cited that under the garb of maximizing public good and to be able to serve the greatest number of people, there is no better method than free and fair auctions and that auctioning spectrum is the most transparent method of spectrum assignment and allows service providers to decide on their technology, be it terrestrial, satellite, or any other.

As clearly mentioned above, satellite spectrum is a shared resource which is used by multiple satellites across multiple orbits. Auctioning satellite spectrum would lead to spectrum fragmentation and inefficient utilisation of the spectrum.: There are multiple users of satellite spectrum, viz., VSAT, DTH, broadcasters and teleport. Any plan to auction spectrum only for satellite communications would create a host of complications in various industry segments affected by this. Apart from Satcom, DTH and broadcasting are powerful vehicles for creating public good and the penetration of these could get adversely impacted if satellite spectrum is auctioned.

7. The suggestion that deep pocketed players be given the spectrum so that they may decide as to how to utilise the spectrum is a flawed idea. Deep

pocketed players could use auctions to capture and hoard a disproportionate amount of spectrum and become gatekeepers and block the entry of new operators and startups. This would be deemed as a regressive and anti-competitive approach which would harm the economy and the nation.

8. As already mentioned in our response to Point No. 4 above, Hon'ble SC has in its presidential reference in the 2G matter has not mandated auction of spectrum as the only method of delineation of a scarce natural resource like spectrum.

9. <u>AOB: Pitfalls of assigning the spectrum on an exclusive basis for possibility of auction</u>

(i) Consequence of auctioning of spectrum will result in the market leaders using this opportunity to block the entry of new players in the market. **Both DoT and TRAI will find themselves helpless once the spectrum gets auctioned and the terms of sharing are defined and embedded in the NIA**. They can only intervene in the spectrum usage criteria, once the license expires even while the technology keeps progressing, making the sharing strategies become better and better and unlocking more capacities within the same chunk of the auctioned spectrum for supporting additional players. **Once the "private rights" are established through the process of auction, it will become extremely difficult to change the rules of the game in between the license period.** By doing so, DoT would have 'missed the bus' for effective and efficient spectrum sharing and that would be a huge drain on the public exchequer!

(ii) **This is the reason why the FCC has been continuously evolving its sharing rules to unlock more capacity with the objective of supporting more players in the market.** FCC's latest effort is embedded here and will likely get formalized by end of this month. FCC is empowered to do so as they have not created "private rights" for satellite spectrum by auctioning it in the manner we are trying to.

(iii) The issues related to the Satellite spectrum are quite different from those assigned terrestrially. There are virtually no synergies. In the case of the Terrestrial spectrum, the role of the regulator gets significantly limited after assignment, as "**one" operator by itself** is able to **unlock the optimal capacity of the assigned spectrum**. Whereas in the case of the **satellite spectrum**, even **multiple operators can't do so together —** and **without facilitation, from the regulator, the situation will turn worse in no time.**

(iv) So if you try to auction "Club Goods" for "exclusive" use, then one has to be innovative to figure out a way to do that. Some options are already suggested by the TRAI in its paper. **But, none of this will be without severe pitfalls & shortcomings and will compromise the basic tenets of auction.** For example —

a) Huge capacities of airwaves lie idle and unused, as we will be artificially limiting the number of players for the auctions to work;
b) Danger of collusion — leading to the blockage of new players in the market.
c) Inflexibility on spectrum management and regulatory intervention due to the creation of "Exclusive Rights" on goods which are by character "common" in nature;
d) Spectrum fragmentation, as the outcome of spectrum auctions — i.e the demand on quantum cannot be predicted in advance
e) While auctions may be the most optimal method for assignment of spectrum in an exclusive manner, **then using auctions as a tool for making assignments may not be the correct strategy,** that too when and when "sharing" has to be supervised constantly by the regulator for ensuring optimal usage and for the purpose of resolving conflicts between the sharing entities.

This is likely to happen if we follow the DoT request of auctioning spectrum for the satellite service in the manner we have done for terrestrial services.

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx